In the Drawings:

In The Drawings a Replacement Sheet 1 and 3 have been submitted. No new matter has been added. The corrected sheets are in compliance with 37 CFR 1.83(a) and 37 CFR 1.121(d).

Fig. 1 shows reference numerals 14 and 16. They are discussed in the Specification at page Page 8, line 2.

Fig. 3 shows reference numerals 21, 25 and 26. The Replacement Sheets are attached hereto in the Appendix.

Comments/Remarks

Claims 1 and 3 through 24 remain pending in the present application.

In the Office Action, the amendment to the Specification filed on August 18, 2006, was objected to under 35 U.S.C. 132(a) because it allegedly introduced new matter into the disclosure. The amendments of the present response addressed these concerns. No new matter has been added.

Specifically, the amendment to be inserted at Page 8, line 2 has support at page 4, lines 32 through 36.

Regarding the newly modified paragraphs at page 8, lines 35, support for these amendments can be found in the specification at page 5, lines 9 through 28, claim 10 through 12 and claim 20.

Regarding the new paragraph to be added at page 8, line 3, support can be found in the specification at page 5, lines 32 through 35. No new matter has been added.

In the Office Action, In the Office Action, the drawings were objected under 37 CFR 1.83(a) as not showing figures necessary to shown every feature specified in the amended claims. The drawings have been corrected and are provided on Replacement Sheets. Specifically, the filter 14 and hinge 16 have been shown on Fig. 1. No new matter has been added. In Fig. 3, camera 22, filter 24, means 21 and means 25 are shown. Please reconsider Replacement Sheets with regard to Figs. 1 and 3.

Furthermore, pyrolysis section of petroleum cracker is shown at element 1. Interference filter is shown at element 14 in Fig. 1 and element 24 in Fig. 3. The panel hinged to furnace is shown in Fig. 1 at element 16. A camera

arranged inside furnace is shown at element 22 in Fig. 3. Means for relaying the information from cameral is shown at element 21. No new matter has been added.

In the Office Action, claims 9, 10, 11, 19, 20 and 21 were rejected under 35 U.S.C. 112(1) as lacking enablement. Applicants respectfully disagree. The relevant disclosure is found in paragraphs [0023] and [0024]. The features concerning the cameras are known to one of skill in the art. Reconsideration and withdrawal of the 35 U.S.C. 112(1) rejection is respectfully requested.

Enablement for claim 9 is found in the specification at page 8, lines 17 through 34.

Enablement for claims 10, 11, 19, 20 and 21 can be found in the Specification at page 5, lines 9 through 29, and pages 6 and 7, lines 36 through 37, and 1 through 6, respectively.

In the Office Action, claims 1 through 24 were rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,249,954 to Allen et al. (hereinafter "the Allen et al. patent") and U.S. Patent No. to Goff et al. (hereinafter "the Goff et al. patent").

Independent Claim 1 is directed to a method of viewing a flame produced by a burner in a pyrolysis section of a petroleum cracker furnace, wherein the fuel burnt by the burner is natural gas. The method has the step of viewing the flame through an interference filter adapted to pass light of the wavelength of sodium only.

Independent claim 13 is directed to an apparatus comprising a furnace, a burner for burning natural gas in the pyrolysis section of a petroleum cracker

furnace and glasses for viewing the flame comprising an interference filter adapted to pass light of the wavelength of sodium only.

Claim 23 is directed to a furnace comprising a burner for burning natural gas housed within the walls thereof and a window provided in a wall of the pyrolysis section of a petroleum cracker furnace, wherein an interference filter adapted to pass light of the wavelength of sodium only is provided in or on the window.

Independent claim 24 is directed to glasses for viewing a flame produced in a pyrolysis section of a petroleum cracker comprising an interference filter provided in each lens thereof, wherein the interference filter is adapted to pass light of the wavelength of sodium only.

The Allen patent is directed to a combustion control system for electronically image sensing and monitoring a flame produced by burning, among other combustibles, natural gas, in a combustion facility. The system provides for a flame sensor, a CCD array camera, and a burner placed proximate a furnace. The system also provides a neural net in a closed loop control system arranged to regulate the fuel-air ratio of the flame based on a monitored fame image such that the combustion efficiency is maintained at an optimal operational level. Allen also teaches the use of interference filters to monitor such a flame within the bandpass of emission of interesting species within the flames, such as CO (2.3 2.4μm) and CO_2 (4.2 to 4.3 μm).

The Goff patent relates to a fiber optics based monitoring system for monitoring the combustion of coal by using an interference (dichroic) filter centered around the sodium D line to cancel out the background blackbody radiation thus allowing the flame to be sensed. The system uses a fiber optic bifurcated cable to monitor portions of light a different bandpasses.

Neither the Allen patent nor the Goff patent are directed to a method, furnace or a pair of glasses to view a flame produced by a burner in a pyroplysis section of a petroleum cracker, as claimed. In contrast, the Allen et al. patent uses a CCD camera to sense the emissions from the plant. Similarly, in the Goff patent, the fiber optic cables are collecting light to monitor the system. Neither system is directed to viewing a flame produced from the pyrolysis section of a petroleum cracker. In fact, in the Goff patent there is a direct teaching against using quartz windows, such as those of the instant invention, in favor of using fiber optic flame detection. (columns 1 and 2, lines 30 through 69 and 1 through 2, respectively.)

The Allen patent does not suggest or disclose a method of viewing a flame produced by a burner in a pyrolysis section of a petroleum cracker, that the fuel burnt is natural gas or that the flame is viewed through an interference filter adapted to pass light of the wavelength of sodium only.

The Goff et al. patent does not correct these deficiencies in the teaching of the Allen patent. In fact, neither the Allen patent nor the Goff patent suggest or disclose pyrolysis section of petroleum crackers or petroleum cracking furnaces in general as claimed in claim 1, 13, 23 or 24.

Therefore it would not be obvious to one of ordinary skill in the art to monitor the natural gas burner flames in the pyrolysis section of a petroleum cracker in the sodium D line as the prior art does not relate to petroleum cracking, but very different technical fields. Further, neither patent teaches monitoring natural gas flames at this wavelength.

Further, the Goff patent only teaches the monitoring of the combustion of coal using an interference filter centered around the sodium D line and does not teach the monitoring of natural gas in this way. Therefore, in view of Goff, the man of ordinary skill in the art would have no motivation to adapt the combustion

control system of Allen by providing an interference filed centred around the sodium D line.

In fact, there is no suggestion in the prior art that burning natural gas will produce emission in the sodium D line. Indeed, it is the unexpected discovery of traces of sodium in natural gas that has lead the inventors to develop the claimed method of monitoring natural gas flames in the pyrolysis section of a petroleum cracker in the sodium D line. Because the prior art does not tech that such an emission line will be present when monitoring the burning of natural gas in the pyrolysis section of a petroleum cracker, it would not be obvious for one of ordinary skill in the art to view the flame at this wavelength to cancel out the blackbody radiation. Thus this deficiency in the teaching of the prior art, and in particular, the prior art of Allen, is not remedied by the teaching of Goff or of any other prior art.

In the Office Action, a case was cited evidently in response to Applicants' argument attacking the references individually to prove non-obviousness when the rejections are based on a combination. Applicants show the deficiencies in each of the references to further point out how neither of the references show the claimed invention and to further show that neither reference compensates for the other's deficiencies.

In the Office Action, Official notice was taken to claims 2 and 3 as being obvious and well known. Applicants respectfully disagree. Claim 2 was canceled. With regard to claims 3, the Official Notice must be supported by documentary evidence.

The Action took official notice to claims 4, 5, 14, 15, 16, and 17. The Office Action further states that it is well known that quartz is transparent and has high temperature heat resistant properties and is known to be used for optical elements and viewing windows in furnaces. Neither of references used to reject

the claims of the instant invention used quartz for that purpose. In contrast, they both use a camera or fiber optic cables for viewing.

In the Office Action, Official notice was taken with regard to claims 8, 18, and 24. Again, neither the Allen et al. Patent nor the Goff patent used filtered glasses or goggles for viewing any flame. In contrast, they both use a camera or fiber optic cables for viewing. In particular, in the Goff patent there is a direct teaching against using quartz windows, such as those of the instant invention, in favor of using fiber optic flame detection. (columns 1 and 2, lines 30 through 69 and 1 through 2, respectively.)

In the Office Action, Official notice was taken with respect to claim 7, because it is allegedly well known to hingedly mount glass observation panels over the opening. Applicants again disagree. Neither the Allen et al. patent nor the Goff patent are directed at systems or methods that use visual viewing. There is no reason why any glass observation panel would be used in either of the references of record.

In the Office Action, claims 9, 11, 19 and 21 were rejected as being merely matters of design choice that absent any new or unexpected results produced therefrom over the prior art of record. Claims 9, 11, 19 and 21 are directed to critical aspects of the invention. Therefore, the claimed subject matter, if matters of design choice should be easily found in the prior art.

Accordingly, reconsideration and allowance of the claimed invention is respectfully requested.

Respectfully submitted,

February 2, 2007
Date

Paul D. Greeley
Attorney for Applicant(s)
Registration No. 31,019
Ohlandt, Greeley, Ruggiero & Perle, LLP
One Landmark Square, 10th Floor
Stamford, CT 06901-2682
(203) 327-4500